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EXAMINER	
HURST, JONATHAN M	
ART UNIT	PAPER NUMBER
1797	

NOTIFICATION DATE	DELIVERY MODE
07/21/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/570,488	WADA ET AL.	
	Examiner	Art Unit	
	JONATHAN M. HURST	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *4/28/20101 and 06/11/2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 22-23 and 28-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawai et al. (US 4,350,594-previously cited).

In rejecting the claims, the examiner is basing the rejection of the selection of steps (2) and (3) however it is noted that the membrane / molecular sieve used in step 2 is fully capable of performing the action of step (1) however the said membrane/ molecular sieves is not mentioned as being selectively hydrophobic.

Regarding claims 22-23 and 28 Kawai et al. discloses a method of preparing a product solution by removing of biological components from a human derived biological components-containing solution which comprises subjecting the biological components-containing solution to at least two of the following three treatment steps in succession; (See Abstract)

wherein the two treatment steps are (2) subjecting a solution to a step of removing a portion or all of proteins having a molecular weight equal to or higher than that of albumin by fractionation with a molecular sieve membrane and retaining a portion of the solution from which the proteins have been removed; (See Col. 3 Lines 1-20 and Fig. 1 where treatment step 2 is performed in 4 using molecular sieve 5)

and (3) subjecting a solution to a step of concentrating proteins by passing a the solution through a porous separation membrane and retaining the treated portion of the solution that does not pass through the porous membrane wherein the product solution is the retained, treated portion of the solution from at least two of the three treatment steps. (See Col. 3 Lines 23-54 and Fig. 1 where treatment step 3 is performed in 10 using membrane 11)

Regarding claim 29 Kawai et al. discloses an apparatus for preparing a solution by removing biological components having from a biological components-containing solution, wherein the apparatus comprises at least two modules joined by a flow path and selected from the following modules (2) a module for removing a portion or all of proteins having a molecular weight equal to or higher than that of albumin by fractionation with a molecular sieve; and (3) a module for concentrating proteins by passing a portion of the solution through a porous separation membrane and retaining the portion of the solution that does not pass through the porous membrane. (See Abstract, Fig. 1 and Col. 3 Lines 1-60 where a first module 4 contains molecular sieve 5

which remove at least a portion of protein of larger molecular weight than albumin and a second membrane module 10 with membrane 11 where some forms of protein are concentrated and retained).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 24-26 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai et al. (US 4,350,594) in view of Kim et al. (US 7,441,666).

In rejecting the claims, the examiner is basing the rejection of the selection of steps (2) and (3).

Regarding claims 24-26, Kawai et al. discloses all the claim limitations as set forth above and does not appear to disclose a molecular sieve and or separation membrane being formed from one or more substances selected from cellulose, cellulose acetate, a polycarbonate, a polysulfone, a poly(methacrylic acid) ester, a poly(acrylic acid) ester, a polyamide, polyvinylidene fluoride, polyacrylonitrile, polyethylene, and polypropylene.

Kim et al. discloses a method of preparing a product solution by removing of biological components from a human derived biological components-containing solution which comprises subjecting the biological components-containing solution to at least two of the following three treatment steps;

wherein the two treatment steps are (2) subjecting a solution to a step of removing a portion or all of proteins having a molecular weight equal to or higher than that of albumin by fractionation with a molecular sieve and retaining a portion of the solution from which the proteins have been removed; and (3) subjecting a solution to a step of concentrating proteins by passing a the solution through a porous separation membrane and retaining the treated portion of the solution that does not pass through the porous membrane wherein the product solution is the retained, treated portion of the solution from at least two of the three treatment steps. (See Abstract and Col. 23 Lines 23-55 where a solution containing proteins is passed through a membrane module and

during which at least a portion of proteins having a molecular weight greater than or equal to albumin are removed from the solution and also during separation at least some forms or weights of proteins are concentrated and retained by the membrane while other proteins which pass through the membrane are also concentrated and retained in some form.)

The treatment steps (2) and (3) are conducted using a porous separation membrane containing one or more substances selected from cellulose and a polyamide. (See Col. 6 Lines 55-65 and Col. 23 Lines 25-55 where a membrane comprising polyamide is used to perform steps 2), and (3)).

Kim et al. further discloses the method further comprising a step wherein one or more substances selected from a group consisting of a polyethylene imine, an aminomethylpyridine, a polyphenol, a blue dye, a divalent metal ion, and an alkyl group-containing compound is fixed to the surface of the molecular sieve used in step (2). (See Col. 10 Lines 48-50 where a membrane to be used comprises a polymer and Col. 13 Lines 30-45 where polymer contains polyethylene imine and as such some will be fixed to the surface)

It would have been obvious to one of ordinary skill in the art at the time of invention to use a molecular sieve and/or separation membrane as disclosed by Kim et al. in the method of Kawai et al. because it is well known in the art to use

sieves/membranes formed from the specific materials as described by Kim et al. to separate biological components from one another, including albumin, as is required by Kawai et al.

Regarding claim 30 Kawai et al. discloses all the claim limitations as set forth above as well as the apparatus for preparing a solution further comprising a liquid flow-out path to-be for transporting the prepared solution (See Fig. 1 where albumin flows out from 10 through line 14)

Kawai et al. does not specifically disclose characterizing the protein solution which comes out of a flow-out-path of the apparatus and the liquid flow-out path joined to a liquid chromatograph, an electrophoretic apparatus, or a mass spectrometer.

Kim discloses in column 21, lines 25-50 that it is known in the art to perform analysis on materials passing though filters and/or molecular sieves in order to determine the effectiveness of said filters and/or molecular sieves and what one way to characterizing proteins is by passing through a chromatograph.

It would have been obvious to one of ordinary skill in the art at the time of invention to characterize the protein containing solutions of Kawai et al. as described by Kim et al. because it is known in the art that such measurements are performed in order to measure the effectiveness of the device.

Furthermore it is noted that one of ordinary skill in the art at the time of invention would have been motivated to perform analysis on the solutions entering, exiting, and entrapped by the device of Kawai et al. in order to determine whether the device is operating in the intended manner and ensure the safety, and effective treatment, of the patients undergoing treatment using the disclosed device of Kawai et al.

Furthermore it is noted that it is very well known in the art, as shown by Kim, to analyze and characterize protein containing solutions passed through filters and/or molecular sieves using liquid chromatographs, electrophoretic apparatuses, or a mass spectrometers in order to understand the constituents and or determine purity of a said solution. Connecting the output of one device to the input of another device when a product is meant to be conveyed from said one to another is very well known in the art. Therefor it would have been obvious to one of ordinary skill in the art at the time of invention to connect the liquid flow-out path of Kawai et al. to a liquid chromatograph, an electrophoretic apparatus, or a mass spectrometer in order to quickly and efficiently convey the product for analysis as is well known in the art. In addition, the substitution of one known technique for another is clearly within the scope of the skilled artisan.

Furthermore directly connecting the output of a filtration device to the inlet of a chromatograph is considered merely forgoing the use of separate modules where the two modules are known in the art to be used together. It has been held that one of ordinary skill in the art at the time the invention was made would have been led by the applied references to forgo use of separate modules, along with their function and

benefit, where doing so is technically feasible and would reduce cost. See In re Thompson, 545 F.2d 1290, 1229, 188 USPQ 365, 367 (CCPA 1976).

5. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable Kawai et al. (US 4,350,594) in view of Kim et al. (US 7,441,666) and further in view of Comper (US 2002/0022236).

Regarding claim 27 Kawai et al. discloses all the claim limitations as set forth above as well as the method of preparing a solution according to the claim 22 does not specifically disclose the use of a blue dye added to the solution in order to perform analysis.

Kim discloses in column 21, lines 25-50 that it is known in the art to perform analysis on materials passing though filters and/or molecular sieves in order to determine the effectiveness of said filters and/or molecular sieves and what one way to characterizing proteins is by passing through a chromatograph.

It would have been obvious to one of ordinary skill in the art at the time of invention to characterize the protein containing solutions of Kawai et al. as described by Kim et al. because it is known in the art that such measurements are performed in order to measure the effectiveness of the device.

Furthermore it is noted that one of ordinary skill in the art at the time of invention would have been motivated to perform analysis on the solutions entering, exiting, and entrapped by the device of Kawai et al. in order to determine whether the device is operating in the intended manner and ensure the safety, and effective treatment, of the patients undergoing treatment using the disclosed device of Kawai et al.

Comper discloses the use of a blue dye in order to detect albumin in a solution during a filtration process. (See [0085])

It would have been obvious to one of ordinary skill in the art at the time of the invention to add a blue dye as described by Comper to the solution of modified Kawai because the blue dye of Comper is able bind to albumin selectively over other unwanted compounds during detection (See Comper [0085]) and allows one to detect the amount, i.e. purity, of an albumin containing solution during a filtration process as is required by modified Kawai.

While the reference does not explicitly disclose adding the blue dye before step (2) it is noted that selection of any order of performing disclosed process steps is prima facie obvious in the absence of new or unexpected results. See Ex parte Rubin , 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious

claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results); In re Gibson, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is prima facie obvious.). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to dye the albumin containing solution before step (2), as it amounts merely to change of the order of performing disclosed process steps in the absence of new or unexpected results.

6. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable Kawai et al. (US 4,350,594) in view of Buck et al. (US 4,935,141).

Regarding claim 31 Kawai et al. discloses a method of preparing a product solution by removing of biological components from a human derived biological components-containing solution which comprises subjecting the biological components-containing solution to at least two of the following three treatment steps in succession; (See Abstract)

wherein the two treatment steps are (1) subjecting a solution to a step of adsorbing on to a substrate a portion or all of proteins having a molecular weight equal to or higher than that of albumin and retaining the treated portion of the solution from which the adsorbed proteins have been removed **or** (2) subjecting a solution to a step of removing a portion or all of proteins having a molecular weight equal to or higher than

that of albumin by fractionation with a molecular sieve membrane and retaining a portion of the solution from which the proteins have been removed; (See Col. 3 Lines 1-20 and Fig. 1 where treatment step 1 or 2 is performed in 4 using membrane/ molecular sieve 5 and said membrane is fully capable of performing the portions of either steps (1) or (2) as recited above)

and (3) subjecting a solution to a step of concentrating proteins by passing a the solution through a porous separation membrane and retaining the treated portion of the solution that does not pass through the porous membrane wherein the product solution is the retained, treated portion of the solution from at least two of the three treatment steps. (See Col. 3 Lines 23-54 and Fig. 1 where treatment step 3 is performed in 10 using membrane 11)

It is noted that the membrane / molecular sieve (See Fig. 1 membrane /molecular sieve 5) could be used to perform the portions of either steps (1) or (2) as described above.

Kawai et al. does not specifically disclose in step 1 the membrane being hydrophobic and/or the molecular sieve of step 2 having a molecular weight cut off value of 50 KD or lower.

Buck et al. discloses the use of a hydrophobic membrane in dialysis for adsorbing at least a portion of all proteins having a molecular weight equal or higher than that of albumin. (See Abstract and Col. 2 Lines 25-32 where the membrane is made from a majority of hydrophobic polymers)

Assuming steps 1 and 3 are chosen to be performed it would have been obvious to one of ordinary skill in the art at the time of invention to use a hydrophobic polymer membrane which adsorbs proteins with a molecular weight higher that that of albumin as described by Buck et al. in the method of Kawai et al. because it is well known in the art to use such membranes in order to filter out desired proteins by adsorbing them to the said membrane as is required by Kawai et al.

Furthermore it is noted that all membranes must inherently be either hydrophobic or hydrophilic to some extent and as such it would have been obvious to one of ordinary skill in the art to choose one known type of filter, hydrophobic, from a limited number of known types of filters in the method of Kawai et al. because "a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense."

Furthermore assuming that steps 2 and 3 are chosen to be performed it is noted that while modified Kawai et al. does not specifically disclose the molecular sieves or membranes having a molecular weight cut off value of 50 KD or lower, modified Kawai

et al. does disclose modifying the molecular weight cut off value depending upon the type of substance desired to be removed from the blood. As the size of substances which are filtered out and level of fractionation are variables that can be modified, among others, by adjusting said molecular weight cut off value of said molecular sieve/membrane, with said size of materials filtered decreasing as the molecular weight cut off value of said molecular sieve/membrane is decreased the precise molecular weight cut off value would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed molecular weight cut off value cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the molecular weight cut off value of the molecular sieve/membrane in the method of modified Kawai in order to obtain the desired size of materials separated and filtered from a solution (In re Boesch, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (In re Aller, 105 USPQ 223).

Response to Arguments

7. Applicant's arguments with respect to claims 22-31 have been considered but are moot in view of the new ground(s) of rejection.

In regards to the affidavit/declaration filed 06/11/2010, it is noted that all arguments are directed to the combination of Demmer et al. and other references. It is noted that the above newly provided rejections do not rely on the Demmer reference nor do they rely on ion exchange membranes as discussed in the said affidavit/declaration and as such the presented arguments/conclusions in the declaration are moot.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN M. HURST whose telephone number is (571)270-7065. The examiner can normally be reached on Mon. - Thurs. 6:30-4:00; Every other Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Marcheschi can be reached on (571)272-1374. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. M. H./

Examiner, Art Unit 1797

/Michael A Marcheschi/

Supervisory Patent Examiner, Art Unit 1797